

MEMORANDUM FOR CHIEF OF NAVAL OPERATIONS (N096)

SUBJECT: Digital Nautical Chart (DNC®) Program

1. The National Imagery and Mapping Agency (NIMA) continues to make progress converting the portfolio of 4,820 paper nautical charts into a Vector Product Format Digital Nautical Chart (DNC) database. Upon completion, the DNC will support the Fleet's electronic chart navigation requirements between 84° North and 81° South. Additionally, we are upgrading the database for operational readiness and plan to have DNC Region 17 validated safe for navigation by mid-year. As we progress in this effort, I would like to take this opportunity to discuss our production accomplishments to date, provide you with an overview of our DNC production and maintenance plan schedule for the next five years, and address other important program concerns.

2. DNC PRODUCTION PROGRAM STATUS.

a. To date, we have populated 99% of the DNC database and project a completion date of March 2000 for meeting Navy requirements (Enclosure 1). Moreover, in the past three years, we distributed approximately 60% (3,000 digitized charts) of the DNC data on CD-ROM covering the 29 Geographic Regions (Enclosure 2). These early release data sets provide the Fleet with DNC familiarity and support systems tests, training, and evaluation capability on a host of Navy electronic navigation systems.

b. I am also pleased to inform you that over a year ago we established a DNC Homepage (www.nima.mil/dnctest) to keep the Fleet, Navy staff and systems developers apprised of significant DNC activities. We have recently made the FUND 2.5 software and downloadable DNC data files available via this web site. We are now preparing to make this homepage available on the NIMA Gateway via the SIPRNET.

3. DNC MAINTENANCE PROGRAM CY00.

At the end of last year, we implemented a limited in-house maintenance program. To begin with, we will maintain DNC Region 17 (Eastern US) with the latest Notice to Mariners data. We will schedule DNC Region 13 (North America West) as the next priority region targeted for maintenance, and keep it current with Notice to Mariners data as well. We will make available online – via the DNC Homepage – these two DNC regions with updated Notice to Mariners information. In some cases, the data will contain additional information that is not normally published in the Notice Mariners against the paper charts, including the addition of survey data. For those ships and units not having access to the NIMA Gateway, we will still provide the database with electronic updates via CD-ROM or DVD media. However, our goal is to export DNC data via the NIMA Gateway and eventually move away from managing standard hard copy products. Enclosure 3 contains the NIMA DNC Maintenance Plan and Schedule for Calendar Years 2000 to 2005.

4. DNC UPDATE SERVICE.

a. We recently completed a test of the VPF Database Update (VDU) File Replacement process. Unfortunately, we have had little success in implementing the VDU within our production process to meet all of the Navy requirements.

b. As an interim solution, we are now examining the *File Patch Method* for updating DNC data. The *File Patch Method* shows some promise when compared to the File Replacement method. Additionally, we are also evaluating the exportation of new *Replacement Libraries* via the NIMA Gateway. A final VDU report and recommendation will follow on these two options.

5. Finally, let me assure you that we are committed to providing the Navy worldwide coverage of the DNC database to support operational requirements. We are confident that DNC coupled with an Electronic Chart Display and Information System, electronic updating service, and near real time positioning using a Global Positioning System (GPS) will significantly advance safety of navigation to the Fleet.

6. The NIMA point of contact for this action is Mr. Walter J. Kozak, Navy Customer Support Office (COTN), Mail Stop P-33, and (703) 264-3002.

ANDREW W. SMOAK
Brigadier General, USAF
Director, Customer Support Office

3 Enclosures a/s

cc:

NIMA (D, DH, GI, GICS, GIM, GIMM, GID, GIDB, GIIM)
CNO (N096, NO961E1, N8, N6)
COMDT USCG (G-OPN, C2CEN, NAVCEN)
CINCPACFLT(N3WX)
CINCLANTFLT(N37)
COMNAVMETOCOM(N3)

DIGITAL NAUTICAL CHART MAINTENANCE PROGRAM
Calendar Year 2000

PRIORITY 1

Upgrade and continually maintain:

- a. All the data in DNC® Region 13 – U.S. West Coast.
- b. All the data in DNC® Region 17 – U.S. East Coast.
- c. All data covering DNC® Regions in the U.S. Fleet Homeports/Areas:

Norfolk, VA	Little Creek, VA	San Diego, CA
Puget Sound, WA	San Francisco, CA	Puerto Rico
Key West, FL	San Clemente, CA	Camp Le Jeune, NC
Earle, NJ	Charleston, SC	Staten Island, NY
Kings Bay, GA	Philadelphia, PA	Jacksonville, FL
Newport, RI	Mayport, FL	New London, CT
Groton, CT	Guam	Concord, CA
Pearl Harbor, HI	Long Beach, CA	

- d. All the data covering DNC® Regions in the Fleet Foreign Homeports/Areas:

AUTEC Site, Bahamas	Guantanamo Bay, Cuba
Naples, Italy	Gaeta, Italy
Augusta Bay, Sicily, Italy	Haifa, Israel
Toulon, France	Rota, Spain
Bahrain, Saudi Arabia	Diego Garcia, U.K.
Hong Kong, P.R.C.	Malacca Strait
Yokosuka, Japan	Sasebo, Japan

PRIORITY 2

Upgrade and continually maintain:

- a. All data in Coastal and General DNC® libraries associated with Priority 1 ports/areas.

PRIORITY 3

Upgrade and continually maintain:

- a. All data in remaining Coastal and General DNC® libraries.

PRIORITY 4

Upgrade and continually maintain:

- a. All data in remaining Harbor and Approach Libraries.

(Attachment 1)

Note: NIMA identified the above production database maintenance priorities in accordance with the original DNC® production plan as coordinated by CNO (N096) and the former Defense Mapping Agency in 1989. CNO (N096) did not originally identify DNC® Regions 13 and 17 database coverage areas as a Priority 1 requirement. However, with the increased demands to help Navy certify their Electronic Chart and Display Systems (ECDIS-N), NIMA has identified these 2 DNC CD-ROM Regions to be maintained, in their entirety, to support operational use in CY00.

NATIONAL IMAGERY AND MAPPING AGENCY DIGITAL NAUTICAL CHART (DNC®) MAINTENANCE PLAN

Calendar Years 2000 to 2005

REFERENCE: CNO (N096) letter dated 17 March 1998, subject; U.S. Navy Electronic Chart Display and Information System Policy (ECDIS-N).

INTRODUCTION. This document outlines the NIMA Maintenance Plan and Schedule for the Navy initial DNC database. NIMA and Navy will determine when the initial database is ready for safe navigation by Navy ships, worldwide. Currently, advanced sets of DNC data distributed to the Fleet provide navigators with DNC familiarity, support testing, training, and evaluation, and are usable for situational awareness. A plan of action and milestones for upgrading and maintaining the DNC database is provided with attachments 1 and 2.

BACKGROUND. NIMA has scheduled the upgrade and continual maintenance of the initial DNC database by priority library areas. NIMA has put together a plan to achieve worldwide maintenance, based on our present capabilities and known process developments as follows:

- Sizing - In building the estimates for meeting the DNC maintenance timelines by 30 September 2001, we estimate that we will require in excess of 675 people, and a very sizeable contract program to bring all the data up-to-date and keep it up-to-date. The current programming and staffing plans allow for a maximum of 200 people to perform this work, extending the estimated operational dates of the DNC database well into the 2004 and 2005 time frame. Suspecting that these dates are unacceptable for Navy needs, NIMA based the initial DNC database maintenance on priority areas where the Fleet operates, as a way to make DNC operational on a worldwide basis (Attachment 1).

- Justification - Recognizing adequate resources would not be available to complete the maintenance of all the data by 30 September 2001, NIMA, in conjunction with Navy, investigated establishing maintenance priorities. It was found that 44% of the database consisted of Priority 1, 2, and 3 libraries – enough DNC coverage for the Navy to operate in and around its home port areas, and operate safely between any of them. We also estimated these DNC libraries could be made largely operational by 31 December 2001. The remaining 56% of the database consisting of Priority 4 ports can be worked on a priority by priority basis and coordinated with Navy. NIMA plans to have all Priority 4 DNC libraries operational NLT 30 September 2004.

DNC REQUIREMENTS.

- a. Navy Initial Database Requirements - Prior to the stand up of NIMA, the initial requirements for the DNC database construction were identified and coordinated by the former Defense Mapping Agency with Navy for a specific priority list of Navy home and foreign ports and areas. This initial list, which consists of 4,820 sources, did not include NIMA's entire chart

portfolio to be digitized. However, in accordance with the NIMA mission and vision for “*guaranteeing the information edge*”, the DNC maintenance program includes the digital conversion of the remaining portfolio of approximately 1,500 base charts, which will be digitized and ultimately incorporated with the initial database. We have scheduled this conversion program, covering all remaining NIMA hard copy charts, over a span of 4 to 5 years.

b. USCG Requirements - Beginning in Calendar Year 2000, we have scheduled, over the next two years, the digital conversion of all remaining US native charts, and the production of all other NIMA hard copy charts not covered by Navy initial priorities. The DNC database will include the US Great Lakes charts. By the time the DNC initial requirements are complete, the remaining number of charts to digitize for this requirement will be approximately 200.

DNC DATABASE COMPLETION.

a. Initial Navy requirements - NIMA is on-track to have 100% of the initial Navy requirements completed NLT 31 March 2000, consisting of 4,820 digitized charts.

b. Supplemental chart requirements – NIMA expects to complete its remaining portfolio of approximately 1,500 charts by NLT 30 September 2004.

c. USCG requirements – NIMA has programmed the completion of the USCG DNC requirements to be completed by NLT 30 September 2001. This completion date has been coordinated with, and agreed to, by USCG.

THE DNC MAINTENANCE PLAN.

The maintenance process will consist of two phases – *Initial Maintenance* and *Continuous Maintenance*. Simply put, *Initial Maintenance* is defined as all the work it will take to bring the DNC libraries up-to-date. *Continuous Maintenance* is defined as all the work it will take to keep the data current on a continual basis. NIMA will strive to keep DNC Regions 13 and 17 maintained on a weekly basis set to the weekly Notice to Mariners production schedule. DNC 13 and 17 *Replacement Libraries* will be put online on the NIMA Gateway as well as temporarily reside on the DNC Homepage (www.nima.mil/dnctest).

Initial Maintenance - The Initial maintenance of a data set is identified as the work that it will take to fix all data inconsistencies and bring a DNC library up-to-date; by far, this work represents the most workyear-intensive part of the maintenance process. The work will be done through a combination of in-house and contract processes, designed to take best advantage of the relative strengths of each process. Estimated completion of this phase is NLT 31 December 2001 for Priority 1, 2, and 3 DNC libraries; and NLT 30 September 2004 for Priority 4 DNC libraries. The initial phase has already begun with DNC Regions 1, 7, 8, 9, 13, 14 and 17.

Continuous Maintenance - In the Continuous Maintenance phase, NIMA will keep all the DNC libraries up-to-date. Resource expenditures are expected much lower than those needed during the Initial Maintenance phase (The goal of the Continuous Maintenance phase is to process new data into the DNC database on a source-arrival basis.). The Continuous

Maintenance phase will immediately follow Initial Maintenance. All Priority 1, 2, and 3 DNC libraries will go into Continuous Maintenance NLT 1 January 2002, while the Priority 4 DNC libraries will begin Continuous Maintenance NLT 1 October 2003.

TIMELINES (Plan of Action).

See the DNC Completion and Maintenance Timeline Chart, Attachment 2.

DISTRIBUTION OF DNC UPDATES.

a. VPF Database Update (VDU) File Replacement Service – At the time of this writing, we have determined that the VDU process is a very difficult and costly process for updating DNC Data in the Fleet. As such, other options are being pursued. A final VDU and recommendation will follow.

b. Electronic Updating via DNC *Replacement Libraries* – NIMA will make only the updated DNC libraries available, on a weekly or monthly basis, depending upon type of media. Upon acceptance or completion of the updates to a DNC library, NIMA will immediately post online the updated DNC library both on its Gateway and temporarily on the DNC Homepage web site. Updates, as determined by NIMA, will be performed on a weekly basis in concert with the weekly Notice to Mariners.

c. CD-ROMs – Navy identified CD-ROMs as the media acceptable for distribution of DNC, whether it be the baselined data, or updates to the baseline. Upon acceptance, or completion of a group of updates, NIMA will generate a new edition of each CD-ROM on a monthly basis. Replication and distribution turnaround times are expected to be no faster than seven days from the time that NIMA sends the mastered data sets to its contractor. Automatic Distribution will be implemented from the replication contractor site upon completion of the DNC CD-ROM.